CUSTOMER NUMBER **25268**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Jerry Brownstein et al.	Attorney Docket No: BROW0005
Serial No:	10/646,944	Group Art Unit: 1771
Filed:	August 21, 2003	Examiner: Cole, Elizabeth
Title:	LOOSE FIBER ADSORBENT	

DECLARATION

Bellevue, Washington 98004

June 26, 2006

TO THE DIRECTOR OF THE PATENT AND TRADEMARK OFFICE:

The following declaration of Jerry Brownstein, one of the co-inventors of the above-identified patent application, is submitted as part of a response in that application, to an Office Action dated March 29, 2006.

1. I, Jerry Brownstein, have been professionally involved in the textile industry for over 35 years. The textile industry produces a large amount of fabric and textile waste each year. This waste includes used clothing that is too damaged for reuse, as well as manufacturing wastes. Shredding such waste can yield recycled fibers; however, the volume of recycled fibers available has generally exceeded the demand for such recycled fibers. Almost 50% of recycled textiles are recycled back into clothing. About 20% become wiping and polishing cloths, and another 25% are converted back into a fibrous state. Little of this fiber (referred to as "shoddy") is currently being re-spun into new textiles, because such regenerated fibers are weaker than virgin fibers, resulting in a lower quality fabric. Instead, shoddy is often used in lower value applications, such as for furniture stuffing or insulation in vehicles. However, the demand for shoddy, particularly shoddy that is primarily synthetic fiber (known as "poly shoddy"), is generally significantly less than the available supply. In many areas of the country, rag mills are forced to dispose of poly shoddy in municipal landfills, at costs of up to five cents a pound. Furthermore, the annual worldwide production of virgin synthetic fibers exceeded "46 billion pounds in 2002" as quoted in Textile World, page 71, Sept. 2004, and that volume is increasing annually. Such production levels strongly suggest that the amount of synthetic fabric/fiber waste will only continue to increase. Based on my experience in the textile industry, and recognizing that more waste/scrap synthetic fiber was available than was being used, I began looking for additional commercial uses for recycled synthetic fibers.

2. Further, I am a co-inventor of the subject matter described and claimed in the above-identified patent application, U.S. Serial No. 10/646,944, and as such, am familiar with the subject matter disclosed and claimed therein. I am also familiar with a commercial embodiment based on the

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invention described and claimed in that patent application, which is sold under the trademark X-TEX®. The X-TEX product comprises a majority of delustered synthetic fibers obtained from recycling textile waste.

3. My co-inventors and I conceived of using recycled synthetic fibers as a sorbent for hydrocarbons, such as in oil spills. We developed a prototype sorbent product based on such recycled synthetic fibers and proceeded to test the sorption properties of the prototype sorbent. A relatively high synthetic fiber content was achieved by pre-sorting textile waste to limit the amount of natural fibers in the prototype sorbent product. The prototype sorbent product included over 90% synthetic fibers, and less than 10% natural fibers (i.e., a majority of delustered synthetic fibers, noting that virtually all synthetic fibers used in textiles have been delustered). During our testing, we determined that our sorbent material worked as well, and in some cases better, than commercially available sorbent products that are based on virgin synthetic fibers (significantly, no commercial sorbent product based on recycled synthetic fibers was found when we did our testing, nor was any commercial product based on delustered virgin synthetic fibers found).

4. The test data reproduced below were generated by comparing our prototype sorbent (in bulk form, i.e., a mass of greater than 90% delustered synthetic fibers and less than 10% natural fibers) with bulk virgin polypropylene fibers (a commercial product used for filling sorbent socks used in sorbent booms). Varying amounts of oil were introduced into 300 mL of water, and the effectiveness of each sorbent at removing the oil from the water was determined, as indicated below.

Weight of oil added to the water sample(g)	**% of oil Adsorbed by Virgin Synthetic Fibers**	**% of oil Adsorbed by Delustered Synthetic Fibers**
5.0	98.3	99.0
1.0	97.4	98.3
0.5	89.1	97.4
0.25	52.8	94.4

Thus, our prototype bulk sorbent product including a majority of recycled delustered synthetic fibers was competitive commercially available products. These results are significant. They show we had identified an additional use for recycled synthetic fibers that often are disposed of as a solid waste, where the quality of sorbent product based on such recycled fibers was comparable to the quality of commercially available sorbents made from virgin synthetic fibers (noting that some recycled products are not well accepted by the marketplace because the quality of recycled products are often far inferior to the quality of virgin products). The fact that our recycled product provided comparable results to commercially available virgin products indicates that there is little chance of an

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end-user deciding to use a commercially available virgin synthetic fiber sorbent in lieu of a recycled synthetic fiber sorbent because of the superiority of the virgin product. If such were the case, then we would not have identified a legitimate use for the surplus of synthetic fiber scrap. In other words, the test results show that our sorbent product could be substituted with commercially available virgin products without sacrificing quality.

5. In summary, the claims in the above-identified patent application, U.S. Serial No. 10/646,944 (i.e., claims directed to an sorbent material comprising a majority of recycled delustered synthetic fibers generated by shredding synthetic textile waste), define a useful sorbent product (having qualities comparable to sorbents made from virgin material) that meets a long felt need of providing an alternative use for synthetic fiber scrap (i.e., delustered synthetic fiber scrap) from the textile industry. Since developing this technology, we have produced approximately 28 tons of sorbent comprising a majority of delustered synthetic fibers, by shredding primarily synthetic textile waste that likely would otherwise have been disposed of as a solid waste. Given that rag mills having a surplus of synthetic fiber/fabric scrap must pay to dispose of that material as a solid waste, it is clear that rag mills have a strong financial incentive to find alternative uses for synthetic fiber scrap (i.e., some use other than disposing of the synthetic fiber scrap as a solid waste). Before the invention of our delustered synthetic fiber based sorbent product, there is no evidence of any use of recycled delustered synthetic fiber scrap as a sorbent. If such a use was truly obvious, then rag mills (who clearly had a financial incentive to find an alternative use for synthetic fabrics scrap and recycled synthetic fibers) should have been motivated to develop an equivalent sorbent. The fact that rag mills were motivated to find additional products into which synthetic fiber scrap could be incorporated, and failed to recognize that such synthetic fiber scrap could be used to produce a sorbent product, provides strong evidence that our invention as defined in the claims of the above-identified patent application (i.e., a sorbent comprising a majority of recycled delustered synthetic fibers made from recycled synthetic textile waste) meets a long felt need of an additional commercially valuable product that can be made from synthetic fiber scrap, and is novel and non-obvious.

6. I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: June 26, 2006

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A Polyester Saga, Geography And All
John E Luke
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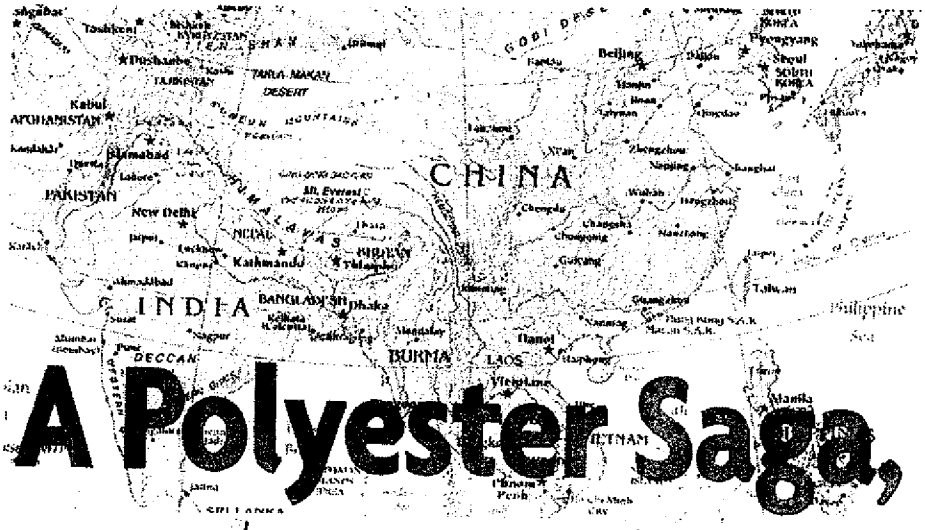

A Polyester Saga, Geography And All

Polyester continues to dominate the man-made fiber arena, with increasing production in China and India.

By John E. Luke, Technical Editor

In past articles, ***Textile World*** has regularly documented the shrinking man-made textile fiber industry in the industrialized world and the concomitant explosive rise of production in the developing economies of Asia. The logic is brilliant in its simplicity: Asian economies built large export businesses and programs by vertically integrating fiber, fabric and garment manufacturing, thereby ensuring that the entire value added in the supply chain remains in the country of origin. Driven by apparent comparative advantage in wages and enticed by the siren call of reduced unemployment and acquisition of hard currencies to fuel further expansion into a full range of consumer goods, Asian countries crafted and implemented well-designed programs to capture global garment manufacturing.

Specifically, Asian countries and companies focused on manufacturing polyester, which virtually has become the fiber of choice, albeit often combined with cotton, in garment production. Examination of the movement of the critical mass of fiber manufacturing from the industrialized West to the developing East is a study in comparative economics and social realities.

It is increasingly clear in what region fibers will be made, but the question of the leading country or countries in the region is less obvious. Preliminary data exhibiting the difficulties in accurately projecting fiber demand and production may shed some light on the situation.

Production data are used for this comparison. The textile and apparel complex long ago became global, and demand is unfettered by political borders. The Asian export model retains the total value added and is designed to compete worldwide.

The World Of Fibers

Table 1 details the recent history of the major participants in the man-made fiber industry and projects volumes into 2010.

According to the United Nations, world population will reach 6.812 billion people by 2010. World per capita production of man-made fibers reached 12.35 pounds per person in 2000, representing a decade-long annualized increase of 2.99 percent, most of which came in the 1995-2000 period, when production surged by a compounded 4.86 percent per year, driven by enormous increases in Southeast Asia in an export response to a regional recession and economic crisis. Repetition of such rates is unlikely, so a lower rate of growth is forecast through the first decade of the new century. Given the energy drag created by unrest in the Middle East and possible banking problems in several Asian nations, total production rate increases are forecast at about the level of the 1980s to early 1990s experience, yielding a man-fiber production of 98.275 billion pounds in the year 2010, and, adding in cellulosics, total man-made fiber production of 102.175 billion pounds.

Product Forecasts

This is an article about polyester, but one fiber does not move in an airless vacuum. Substitution still is a valid competitive strategy that, unfortunately for some fibers, often is designed away in a race to penetrate a new market area. The result is what is seen today. By and large, fibers are used for their utility in specific markets. Acrylic is bulky and chemical-

resistant. It is not as good in permanent-press. Polyester is difficult and expensive to dye, but has attributes that make it ideal for blending with cotton and in resin applications. Nylon covers floors and women's legs. It can be treated for dirt and dust resistance and spun into fine, sheer filaments to enhance the female leg.

Looking forward to 2010, it is projected that polyester and olefins will continue to dominate fiber growth. Other fibers will struggle to maintain position, and several will formally enter the decline phase of the product life cycle. Their role in helping polyester dominate the man-made fiber world deserves comment.

Acrylic

Recent world production of acrylic fibers has stagnated at the 6 billion-pound level, most of which (58 percent) is produced in China and Europe. Acrylic gradually is losing the price battle with polyester and increasingly is relegated to bulk and wool-substitute end-uses. Acrylic's excellent chemical resistance makes it natural for a multitude of markets, and the fiber will continue to shine in water and gas filtration uses in response to clean water and air initiatives. Growth in traditional apparel and home fashion uses is limited at best. A slightly decreasing production pattern is predicted by 2010, and acrylic is probably heading for serious decreases in production in the second decade.

Cellulosics

Viscose-based cellulosic fibers lead the race to oblivion. Lyocell offers an environmentally attractive substitute to traditional viscose and, to the extent that producers want rayon, lyocell will expand and satisfy this need. The costs and risks of viscose are too much for an environmentally aware economy to bear. World production of cellulosics is concentrated in Europe and China. Europe is closing viscose operations, and China likely will follow suit under environmental pressure from World Trade Organization members. Alternatively, there may be increasing emphasis on cotton or, most likely, higher-level blends of polyester with cotton, thereby stretching the available cotton supply and absorbing the expected deluge of polyester, both filament and spun.

Nylon

Nylon, the granddaddy of man-made fibers, seems to be losing share to polyester, overwhelmed by sheer volume if not performance. In carpets, staple nylon gradually is being replaced by filament; tires increasingly use polyester over nylon; and many woven industrial and apparel fabrics seem to favor polyester. Nylon's dyeability is an advantage, but not sufficiently so to overcome the supply and variants available in polyester. Nylon is on a cusp.

The recent purchase of INVISTA™ Inc. by Koch Industries Inc., Wichita, Kan., from DuPont, Wilmington, Del., leaves Invista yet to establish a market identity beyond apparently continuing the DuPont technological advantage mantra. Koch has proven a quality steward of the polyester assets acquired from Hoechst AG, Frankfurt, and is expected to manage these new nylon assets with similar conviction. Time, likely two to three years, will tell.

Olefins

In 2002, Europe and the Western Hemisphere produced approximately two-thirds of world olefin supplies (not including cigarette tow), with China adding an additional 17 percent. Olefin is a fiber of home and industrial utility, somewhat out of the view of economies intent on increasing employment through garment manufacturing. Generally, polypropylene in carpets and disposable diaper cover stock appeals to industrialized economies that have moved beyond the subsistence level of Abraham Maslow's Hierarchy of Needs. As Asian economies improve from the problem days of the late 1990s, it is expected they will increasingly embrace polypropylene-containing textile materials, possibly starting with geotextiles to create additional infrastructure and arable land for foodstuffs.

Polyester

Polyester is king. As recently as 1990, world polyester production (filament and staple) totaled 20 billion pounds. In 2002, production had more than doubled to more than 46 billion pounds. The world man-made fiber industry shipped more polyester in 2002 than it had shipped in total product 12 years earlier. And this increase forever changed the world map of fiber production. In 1990, the West and Europe accounted for 43 percent of total world polyester production. By 2002, the balance had shifted dramatically. First, South Korea made a run at first place in the 1990s, but lately it appears to have reduced its ambitions. Taiwan maintains a posture similar to that of Korea. The big player obviously is China. Polyester production in China

World Man-Made Fiber Production (billion lb)

	1990	1995	2000	2002	2005	2010
Acrylic	5,115	5,391	5,886	5,952	5,500	5,000
Nylon	8,241	8,244	8,976	8,609	8,500	8,150
Polyester	19,131	26,248	42,050	46,200	53,000	64,000
Olefin	6,792	9,610	12,647	12,076	15,000	20,000
Cellulosic	6,079	5,371	4,884	4,670	4,450	3,900
Other	348	600	691	797	900	1,125
Total	45,706	55,464	75,134	78,276	87,350	102,175

Table I

Source: Fiber Economics Bureau and author's estimates
Note: Numbers may not add due to rounding

grew from a 12-percent share of a 19 billion-pound market in 1990 to 37 percent of a 46 billion-pound market in 2002. This rate (20+ percent compounded annually from 1995 through 2002) cannot be sustained, and it is projected that China will produce approximately 36 billion pounds of polyester in 2010, a 10-percent annually compounded rate of increase from 2002. This effectively will force the rest of the world to limit polyester production to rates similar to those of 2002.

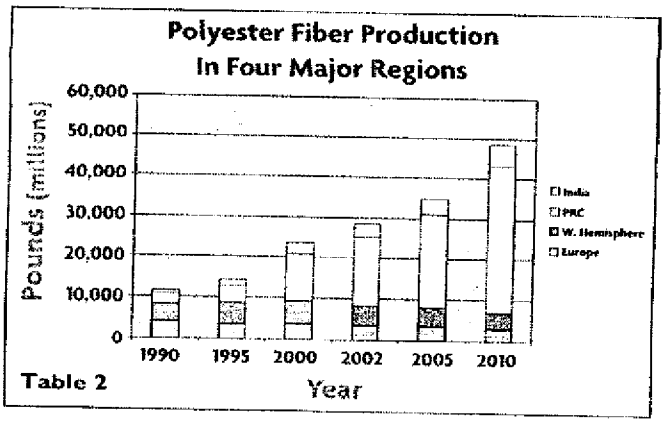

Table 2

India has adopted the Japanese Ministry of International Trade and Industry (MITI) model of industry and government cooperation in fibers, textiles and apparel. According to reports, the program is just reaching the commercial phase. It appears there will be a competition between India and China in polyester fiber manufacturing. Countries with smaller commitments to polyester will be squeezed as these two goliaths meet each other in the marketplace of commodity staple polyester.

This brush with commodity appears to be the underlying strategy behind India-based Reliance Industries Ltd.'s purchase of Trevira GmbH & Co. KG, Germany. *(See "**Textile World** News," **TW**, August 2004).* In announcing this purchase, Reliance, a (if not the) player in the Indian textile and apparel complex, adds a world-recognized brand to its stable of polyester products. Reliance also is constructing several new facilities to raise its capacity to almost 4 billion pounds, which by itself will increase India's world share by more than 7 percent.

With a total world market approaching 65 billion pounds by 2010, competition for market share will be intense, with oil prices pushing up the bottom and a world fiber market squeezing down the top.

Geography

It should come as no surprise to **TW** readers that the production geography of man-made fibers has changed dramatically in the past two decades. Long the preserve of Europe and the United States, fibers now are produced worldwide, with recent emphasis on a few Asian economies, particularly China, Taiwan, South Korea and, most recently, India. In 1990, Europe and the United States controlled 58 percent of man-made fiber production. By 2002, that dominance had dwindled to 33 percent, and an even lower position of 23 percent is projected in 2010. In the late 1990s, Japan reduced its production of man-made fibers. Korea grew through the 1990s but recently has scaled back.

Most growth comes from polyester expansions in India and China. In 1990, China represented barely 8 percent of total man-made production; by 2002 it produced almost 30 percent, almost a tie with the combined total of the United States and Europe. Simultaneously, India began a program aimed at achieving a dominant position in fibers, fabrics and garments. India's government established commerce councils similar to Japan's MITI aimed at strengthening and assisting investment in textile and apparel operations. From a virtually nonexistent position in the 1990s, India currently produces 5+ percent of the world's supply of man-made fibers, with programs in place to expand this further. This is small compared to the position of China, but it starts with only small positions in acrylics and nylon, and a probable diminishing position in cellulosics; and it represents radical growth focused almost entirely on polyester.

In 1990, world polyester production totaled 19,131 million pounds; the four regions of Europe, the Western Hemisphere, China and India produced 59 percent of the total *(See Table 2)*. Over time, polyester production in Europe and the West has slipped, while China and India have engaged in a pitched expansion battle. In 2002, China manufactured 37 percent of all polyester fibers produced in the world and that is projected to rise to more than 55 percent by 2010.

The world of polyester production begins to resemble a monopoly, led by China. Give India credit. It is proceeding with its expansion plans, almost doubling capacity and production in the next decade. Unfortunately, the China colossus is so large that, while India is achieving critical mass for its fabric and garment ambitions, it is hard-pressed to reach a 10-percent share of world production. It is likely, however, that India will earn a strong second place.

Changing Fiber Landscape

The speed with which Asia has dominated fiber production is astounding. The commitment is complete, and the world man-made fiber industry will never be the same — and that's not necessarily a bad thing. It is obvious that production asset investments of the recent decade are world-class in efficiency and quality — with the world consumer receiving the benefits. The industrialized world must move on to a higher-return economy and let the developing world be satisfied by lower returns on investment, either through lower labor or local funds costs; or government-subsidized manufacturing aimed at employment, and/or accumulation of strong currencies to be used for continued economic development. Either way, the new nexus of the man-made fiber business is Asia.